

# Database Security

Duration: 2hrs

SQL Security

# Database Security

**Refers to protecting the database from unauthorised or malicious use.**

- Theft of information
- Unauthorised modification of data
- Unauthorised destruction of data

# **Database Security**

**A view is a mean of providing a user with a personalised model of the database.**

**It is also a useful way of limiting a user's access to various portions of the database.**

**This simplifies system usage while promoting security.**

# Types of View Access

- **Read authorisation**
  - allows reading, but not modification of data
- **Insert authorisation**
  - allows insertion of new data, but no modification of data
  - insertion can be for some of the visible attributes and the remaining will take default or NULL values

# Types of View Access

- **Update authorisation**
  - allows modification of data but not deletion
  - modifications can be for some of the visible attributes
- **Delete authorisation**
  - allows deletion of data
- **A user may be assigned all, none or a combination of these types of authorisation.**

# SQL for Data Control

## *Security and Access Control*

- **Commands:**
  - GRANT
  - REVOKE

# SQL for Data Control

## *Security and Access Control*

- **Based on three central objects:**
  - **Users**
  - **Database objects**
  - **Privileges**  
(select, insert, update, delete, references)

# GRANT

- **Function:**

- *Specify privileges for users on database objects*

**GRANT** <privilege list>  
**ON** <relation or view>  
**TO** <user list>

|               |          |              |                     |
|---------------|----------|--------------|---------------------|
| <b>GRANT</b>  | SELECT,  | <b>GRANT</b> | UPDATE(Designation) |
| <b>INSERT</b> |          | <b>ON</b>    | Employee            |
| <b>ON</b>     | Employee | <b>TO</b>    | Silva, Dias         |
| <b>TO</b>     | Silva    |              |                     |

# GRANT

The SQL **references** privilege is granted on specific attributes (as for update). This allows a user to create relations that reference an attribute (key) of a relation as foreign key.

```
GRANT REFERENCES(Emp_No)
ON      Employee
TO      Silva
```

# Command: REVOKE

- **Function:**
  - *Remove privileges from users on database objects*

**REVOKE** <privilege list>  
**ON** <relation or view>  
**FROM** <user list>

# REVOKE

**REVOKE** SELECT  
**ON** Employee  
**FROM** Silva

**REVOKE** UPDATE(Designation)  
**ON** Employee  
**FROM** Silva

# SQL-92

- **The SQL-92 standard specifies a primitive authorisation mechanism for the database schema.**
- **Only the owner of the schema can carry out any modification to the schema.**

creating or deleting relations, adding or dropping attributes of relations, adding or dropping indices.